



The Firm Strikes Back: Non-compete Agreements and the Mobility of Technical Professionals

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Matt Marx^a

Abstract

This study explores how firms shape labor markets and career paths using employee non-compete agreements. The sociology of work has overlooked non-competes, but data indicate that nearly half of technical professionals in the United States are asked to sign such employment contracts. Fearing loss of investments in talent and trade secrets, firms use non-competes to “strike back” against technical professionals’ increased mobility following the decline of internal labor markets. In-depth interviews with 52 randomly sampled patent holders in a single industry, coupled with a survey of 1,029 engineers across a variety of industries, reveal that ex-employees subject to non-competes are more likely to take *career detours*—that is, they involuntarily leave their technical field to avoid a potential lawsuit. Moreover, firms strategically manage the process of getting workers to sign such contracts, waiting for workers’ bargaining position to weaken. These findings inform our understanding of the social organization of work in the knowledge economy.

Keywords

internal labor markets, externalized labor markets, mobility, employment contracts

Sociological inquiries into workforce externalization and the rise of intermediaries generally view the transition away from internal labor markets as shifting power to firms; individuals are relegated to what Kalleberg (2009) calls “precarious work.” Declining attachment and tenure, growth of nonstandard employment arrangements, and perceived job insecurity certainly threaten lower-skilled workers who lack negotiating leverage (Kalleberg, Reynolds, and Marsden 2003; Mishel, Bernstein, and Shierholz 2007; Sennett 1998), but the impact of internal labor markets’ demise on highly skilled workers is less well understood. One might presume that individuals with particular expertise would fare better in a more itinerant labor

market, given supposed transferability of general human capital among various firms within an occupational field (Becker 1962). Indeed, the few existing studies of highly skilled technical professionals reveal advantages to not being tied to a single employer (Barley and Kunda 2004; Saxenian 1996). Some scholars celebrate replacement of the internal labor market with boundaryless careers (Arthur and Rousseau 1996): no longer limited to ladder-climbing at

^aMIT Sloan School of Management

Corresponding Author:

Matt Marx, MIT Sloan School of Management,
100 Main Street, E62-478, Cambridge, MA 02142
E-mail: mmarx@mit.edu

large corporations, individuals can now take advantage of opportunities across a variety of firms within their chosen profession.

Taken at face value, this literature seems to suggest that the new social organization of work represents an improvement for firms and highly skilled workers. Firms enjoy the flexibility of an externalized workforce, and skilled workers capitalize on the market for their expertise. Indeed, such labor markets might seem ideally suited to high-tech fields. But for firms in technical industries, the advantages of a flexible, mobile workforce may be offset by the risk of losing control over employees whose technological skills represent the company's most valuable assets.

In this study, I show that firms "strike back" against the mobility of high-tech workers via the strategic use of employment contracts. Faced with the risk of losing talent and trade secrets, firms use non-compete agreements to restrict the type and timing of jobs that workers may take if they leave a firm (Valiulis 1985). Moreover, non-compete agreements are used frequently: data from a survey conducted for the present study indicate that nearly half of technical professionals in several industries are subject to non-competes. Despite their widespread use, non-compete agreements have not been examined systematically in the sociology of work—in part because prior studies focus mainly on workers in California's Silicon Valley, where state law renders non-competes unenforceable.

Properly characterizing how firms use non-compete agreements and how their use affects individual workers can further our understanding of labor markets and career patterns. Although other disciplines have examined non-competes, these studies typically analyze effects of policy differences using large data sets that contain no information regarding whether a particular firm required its employees to sign non-compete agreements. I collected original data regarding use of non-competes, including 52 in-depth interviews with technical professionals

sampled at random from patent holders in a single industry as well as an original survey of 1,029 workers across a variety of technology-based industries.

Analysis of these data suggests that firms use non-competes to shape labor markets and career patterns for technical professionals. Workers who desire to change jobs but are subject to non-competes find it difficult to continue in their current occupations; they are likely to take career detours and switch to a different technical field. Furthermore, data suggest that firms are hardly unaware of non-competes' negative implications for their employees. Firms strategically manage the process of obtaining compliance and do not present employees with non-competes until their bargaining power is minimized (e.g., on an employee's first day at work). These findings have important implications for understanding how firms actively manage the quantity and flow of skilled labor in technical fields. The study also raises public policy questions regarding the extent to which non-compete agreements should be regulated.

FIRMS, LABOR MARKET EXTERNALIZATION, AND WORKER MOBILITY

The demise of postwar internal labor markets in the United States is a frequent topic in the sociology of work. Facing pressures such as globalization and deregulation, many firms externalized their workforces beginning in the 1980s to achieve greater flexibility. Firms now rely on labor-market intermediaries (e.g., temporary placement agencies) to screen, hire, manage, and even terminate employees (Kalleberg et al. 2003; Osterman 2004; Pfeffer and Baron 1988). An extensive literature chronicles the accompanying challenges for workers, as the expectation of stable employment within a single firm has been replaced with "precarious work" (Kalleberg 2009). Growth in nonstandard employment relations—including part-time, temporary, and contingent work arrangements (Greenhalgh and Rosenblatt 1984; Summers

1997)—has been held responsible for a host of economic ills, including growing wage inequality, diminished income-class mobility, and persistent poverty (Mishel et al. 2007). Beyond purely financial concerns, externalized workers' less predictable professional paths also carry personal consequences; as Sennett (1998:84) notes, "the good risk-taker has to dwell in ambiguity and uncertainty."

Most studies in this vein focus on low-skilled workers on the periphery of organizations, leaving us with little insight into the fate of highly skilled workers. Scholars may not focus on such workers because they seem less vulnerable to exploitation by firms. For example, Kalleberg (2009:13) suggests there are "opportunities for skilled workers to benefit from changing employment relations." Indeed, unwinding of the internal labor market social contract may favor highly skilled workers as they develop general human capital (Cappelli 1999) and take advantage of the market for their expertise. Sociological and economic analyses proceed from the axiom that technical, managerial, and other capabilities are non-severable from the workers who develop them. As Sørensen (1996:1356) wrote, "abilities are inalienable possessions of the person." Human capital theory shares the assumption that acquired expertise is the sole property of the individual. "You cannot separate a person from his or her knowledge, skills, health, and values the way it is possible to move financial and physical assets while the owner stays put," claimed Becker (1962:16). Inseparability of skills from individuals suggests that workers can use skills developed at (or prior to) one organization or firm when moving to another. Such reasoning underlies the notion that modern careers are not organizationally circumscribed but boundaryless: workers move from firm to firm, carrying their accumulated experience with them (Arthur and Rousseau 1996).

The few studies of technical professionals in the post-internal-labor-market period lend support to the notion that highly skilled workers may benefit from the new social organization of work. Barley and Kunda (2004) found

that many technical professionals prefer externalized employment relations with the expectation of frequent mobility among firms. While acknowledging complications of interacting with labor market intermediaries and the burden of being financially responsible for oneself, the majority of their informants did not desire to return to a system of semi-permanent employment within one firm. In the same vein, Saxenian (1996) observed that job-hopping technical professionals paradoxically enjoy greater geographic stability than do individuals whose careers play out within a single (large) organization, because climbing the ladder within a firm often requires accepting internal transfers to far-flung assignments.

Taken together with the literature on benefits to firms of workforce externalization, these studies of technical professionals in the modern economy suggest that the demise of internal labor markets has been a net positive for firms and highly skilled workers. Yet in the very industries where accrual of technical expertise promises a series of job opportunities over time at various firms within one's chosen field, the resulting interorganizational mobility represents a stark threat for technology companies, whose assets are less related to property, plant, and equipment than to the knowledge and expertise of their workforce. Ex-employees who join other companies are at particular risk of disclosing proprietary information, including trade secrets critical to maintaining a firm's technological advantage (Friedman, Landes, and Posner 1991). Although the patent system affords some protection for intellectual property, multiple surveys indicate that managers regard trade secrets as even more important (Arundel 2001; Cohen, Nelson, and Walsh 2000; Levin et al. 1987). It seems unlikely that firms would simply accept higher levels of employee mobility and the corresponding lack of control over knowledge workers that accompany the decline of internal labor markets.

Instead, firms may respond sharply to technical professionals' increasing itinerancy—a response that can be understood in the context of Fligstein and Fernandez's (1988:23) model of

labor markets as “organized systems of conflict among the buyers and sellers of labor” (for an extended treatment, see Fernandez 1985). In their typology, firm power and worker power are classified according to firms’ ability to regulate the demand for labor and workers’ ability to regulate their supply. For example, organized labor may restrict the overall supply of skilled workers by requiring certification and control workers’ availability to particular firms through collective bargaining. When workers successfully restrict the supply of labor, they tend to stay within the same occupation while moving from firm to firm in worker-controlled labor markets. But Fligstein and Fernandez (1988) do not consider that firms, too, might restrict the supply of labor. To the degree that firms can foreclose external opportunities for current and former employees, they limit negotiating power of otherwise in-demand workers.

One mechanism by which firms assert power over highly skilled workers is a post-employment non-compete agreement. Substituting a formal contract for the expired social contract of the internal labor market, firms legally enforce loyalty among employees who might otherwise be inclined to change jobs and take valuable information with them. Returning to Becker’s (1962) reasoning, even if it is impossible to separate workers from their skills, by exercising post-employment restraints upon ex-employees, it may nonetheless be possible to separate workers from the *use* of their skills. Non-compete agreements enable companies to convert general training into firm-specific human capital by denying workers the opportunity to apply those skills outside the firm. Workers subject to non-competes who attempt to enact a boundaryless career may find very real barriers to exit. In this way, firms use non-compete agreements to strike back against the risk of losing key employees and trade secrets.

Non-compete Agreements: Prior Work and Expected Implications

Although unknown in some labor markets, including academia, non-compete agreements

are common in other sectors. Garmaise (2011) reports that 70.2 percent of firms in the Execucomp database require their top executives to sign non-competes; line managers and individual contributors are also often asked to sign non-compete agreements. In a survey conducted for the present study, nearly half of the respondents from a variety of technical industries reported being asked to sign a non-compete.

Non-compete agreements typically include a list of competitors or technical fields where one may not work for a defined period of time after leaving the firm (typically one to two years). Corporations claim that non-competes are needed to spur investment by enabling them to protect proprietary information, including trade secrets and customer lists (Valiulis 1985), but this claim is not supported empirically. Research and development investment per capita is lower, not higher, where firms are not prohibited from using non-competes (Garmaise 2011). One might ask why non-competes are necessary given that many firms also require employees to sign non-disclosure agreements, which restrict employees from divulging trade secrets while employed at the firm or any time thereafter. Non-disclosure violations can be difficult to detect, whereas it is easier to figure out whether an ex-employee is working at a competitor. Courts have recognized firms’ right to use non-compete agreements due to the difficulty of detecting whether an ex-employee is abiding by a non-disclosure agreement (Decker 1993).

Firms can ask employees to sign any type of contract, although they are by no means required to use non-compete agreements. Firms that use non-competes must rely on either an individual’s willingness to honor the contract or state sanctions to enforce it in case of a lawsuit. No federal law governs non-compete agreements in the United States, so these contracts are generally enforceable unless specifically prohibited by a given state. States with specific legislation restricting enforcement of non-competes include Alaska, California, Connecticut, Minnesota, Montana,

North Dakota, Nevada, Oklahoma, Washington, and West Virginia (Malsberger 1996). California is particularly reluctant to enforce non-competes; its Business and Professions Code Section 16600 states that “every contract by which anyone is restrained from engaging in a lawful profession, trade, or business of any kind is to that extent void.” This provision, which has been traced back to 1872 (Gilson 1999), was reaffirmed by the California Supreme Court in 2008 (*Edwards v. Arthur Andersen* 44 Cal. 4th 937).

Bidwell and Briscoe (2010:1040) observed that “much of the early research on highly fluid labor markets focused on IT [information-technology] workers in Silicon Valley,” which helps explain why non-competes have been overlooked in the sociology of work. In the Barley and Kunda (2004) study, all six of the firms interviewed were located in Silicon Valley, and 69 percent of the technical workers interviewed were California residents.¹ Hyde’s (2003) study of “high-velocity labor markets” was conducted in California’s Silicon Valley. Likewise, Saxenian’s (1994) pro-mobility conclusions were drawn from historical analysis of Silicon Valley; she did not find similar mobility in the Boston, Massachusetts area where non-competes were more strictly enforced. Generalizing too broadly from data collected primarily in a region where non-competes are illegal might reinforce the notion that externalized labor markets are a win-win for firms and skilled workers.

If a state enforces employee non-compete agreements, expertise can be severed from the people who hold it. Workers continue to possess particular skills, but they are prevented from using them.² Governments and trade associations routinely restrict exercise of expertise through certification (Holen 1965), but a non-compete may be the only method by which firms can prohibit workers from using their skills. Non-disclosure agreements might appear to restrict use of expertise, but it is possible to work at a competitive firm using similar skills and yet not disclose any proprietary information from an ex-employer (even if the ex-employer may fear this is

happening). Firms frequently argue that while working at a competitor, an ex-employee will inevitably disclose proprietary information (Valiulis 1985), but this claim is generally used to argue for the use of non-compete agreements.

Transfer of property rights over individual expertise to employers via non-competes may have profound implications for individuals’ ability to obtain employment in their desired occupation or at certain types of firms. To date, the most consistent empirical finding is that non-competes bind workers to their employers (Fallick, Fleischman, and Rebitzer 2006; Garmaise 2011; Marx, Strumsky, and Fleming 2009). But we know little about whether and how these agreements affect individuals who nonetheless change jobs.

Most forms of intellectual property protection restrict the output of the innovative process: a patent protects an invention; employees signing non-disclosure agreements promise not to divulge specific trade secrets. By forbidding ex-employees to work in a similar industry, non-competes restrict access not only to outputs but to inputs as well. Moreover, non-compete agreements are not strictly limited to protecting information or training given to an employee while at a specific firm; rather, they effectively give firms rights over *any* expertise deemed competitive—whether that expertise was developed in training at the firm, during prior spells of employment, or as part of one’s education. Unless content to remain unemployed, workers subject to non-compete agreements may need to change industries when they change jobs.

Despite all this, it is far from straightforward to conclude that non-compete agreements will meaningfully impact the likelihood that workers change fields when they change jobs. Some legal scholars argue that courts are often reluctant to enforce non-competes and other contracts related to individuals divulging trade secrets (Dworkin and Callahan 1998; Koh 1998), but choosing to leave one’s industry does not necessarily require a court order. Instead, an individual may simply believe that the agreement would be enforced if it ever

went to court. Some employees may feel obligated to heed the contract they signed; others may be convinced to do so after receiving threats or cease-and-desist letters from their ex-employers. I thus expect that *ex-employees subject to non-compete agreements will be more likely to take a subsequent job in a different technical field.*

DATA SOURCES

Although multiple scholars have analyzed how non-competes might influence labor markets and entrepreneurship—including studies at the firm (Stuart and Sorenson 2003) and the individual level (Fallick et al. 2006; Marx et al. 2009)—the most common empirical approach has been to analyze the impact of policy differences using large data sets that contain no information regarding whether a given firm required its employees to sign a non-compete.³ As a result, we have little insight into how (or how often) firms use non-competes; furthermore, we lack direct evidence regarding whether and how non-competes affect individual careers.

To address this gap, I collected original data regarding firms' use of non-compete agreements and the implications non-competes have for workers. To my knowledge, this is the first study to assemble such data. I began by conducting 52 in-depth interviews drawn from a random sample of technical professionals in a single industry. I then surveyed 1,029 technical professionals across a variety of industries.

Within-Industry In-depth Interviews

Eisenhardt (1989) advocates building a sample from a single industry to control for extraneous variation. I drew my sample from the automatic speech recognition (ASR) industry, in which intellectual property protection plays a critical role in establishing competitive advantage. Many ASR inventors have a PhD in speech recognition or a related field. I did not know in advance whether any interviewees' career paths had been affected by a non-compete or whether they had ever signed a non-compete.

To assemble the population of inventors, I first created a census of ASR firms—from the inception of the industry in 1952 through 2006—by reviewing more than 11,000 pages of seven ASR trade journals as well as historical documents. This yielded a list of 595 firms, 454 of which were based in the United States. I extracted all firms' patents in ASR-related technical classes: 704, 379/88, and 371/42-44. This resulted in a list of 3,108 patents, from which I constructed a list of 1,459 inventors. To focus on inventors for whom ASR represented a primary focus, I retained only inventors who had at least two patents in one or more ASR-related technical classes. The final list contained 550 inventors. I then randomized the order of the list.

I searched several publicly available databases to locate inventors' current contact information. To reach 60 ASR patent holders (Weiss 1994), it was necessary to contact the first 107 individuals in the randomly ordered list. A comparison of inventors I was able to contact versus those I could not contact reveals no statistically significant differences in geography or the date of their most recent patent (results available from the author). However, individuals I reached tended to have more patents. Figure 1 depicts the geographical distribution of ASR inventors.

Eight of the 60 inventors declined to be interviewed, leaving a total of 52 inventors. I conducted 21 in-depth interviews face-to-face, meeting informants in their homes, at work, or at coffee shops. To do so, I traveled to Phoenix, AZ, Santa Barbara, CA, San Jose, CA, Basking Ridge, NJ, Philadelphia, PA, Pittsburgh, PA, and Seattle, WA. I conducted the remaining interviews by telephone, except for one informant who requested an e-mail interview. Interviews lasted approximately 40 minutes on average. While conducting in-depth interviews, I followed a structured protocol (see Part A of the online supplement [<http://asr.sagepub.com/supplemental>]) to the extent practical. All but three informants allowed me to record the conversation, generating 508 single-spaced pages of transcripts.



Figure 1. Geographic Distribution of Randomly Sampled In-depth Interview Candidates
Note: The sampling frame is U.S. residents holding two or more patents in the automatic speech recognition (ASR) industry between 1970 and 2005.

Following Strauss and Corbin (1990), I selectively coded interview transcripts while remaining open to new insights. Coding was performed using Atlas.ti software version 5. Because circumstances surrounding a non-compete may vary by job, I chose the worker–firm dyad (i.e., job), rather than the worker, as the unit of analysis. The 52 inventors interviewed had held jobs at 78 different firms, for a total of 116 dyads. For six of the dyads, interviewees could not remember whether the employer had included a non-compete in the employment contract. I discarded these, leaving 110 dyads from 46 interviewees for analysis.

For each job dyad, I classified the employer as within the ASR industry or not depending on whether the firm was included in the ASR census of 595 firms. I then coded whether the firm asked the worker to sign a non-compete, and if so, whether the worker complied. I coded workers whose subsequent job was outside ASR as having changed industries. Finally, I coded whether the employee cited

the non-compete agreement as having influenced the decision to leave the industry.

I also coded interviewees’ gender and noted whether they were the founder/CEO at each firm where they worked as well as the number of patents they had filed. I assessed reliability of my coding by having a graduate student previously unacquainted with me code a 20 percent randomly selected subsample of the job dyads. Cohen’s kappa (Cohen 1968) ranged from .75 to 1.0 for various indicators, with a mean of .88. All disagreements were subsequently resolved via discussion.

Cross-Industry Survey

While selection of a single industry for the in-depth interviews may help control for extraneous variation, the findings’ generalizability may be questioned if the ASR industry is idiosyncratic. Therefore, I conducted a survey in conjunction with the Institute of Electrical and Electronics Engineers (IEEE), a nonprofit technical professional association

Table 1. Comparison of the ASR In-depth Interview and IEEE Survey Data

	ASR interviews		IEEE survey		Difference
	<i>n</i>	percent	<i>n</i>	percent	
Female	10	9.10	70	6.80	ns
Founder/CEO	6	5.50	79	7.70	ns
Asked to Sign Non-compete	42	38.10	481	46.80	ns
Asked to Sign, and Did Sign	41	97.60	445	92.60	ns
Signed and Later Left	24	58.50	276	61.90	ns

Note: *N* for ASR in-depth interviews = 110 dyads (from 52 informants); *N* for IEEE survey = 1,029 responses.

that covers several industries and has approximately 215,000 members in the United States. The survey instrument (see Part B of the online supplement) was developed in collaboration with IEEE staff and limited to 20 questions, so it was impossible to gather complete career histories as in the 52 in-depth interviews. Instead, respondents were asked to describe circumstances surrounding the most recent non-compete they were asked to sign (if any) during the past 10 years.

Invitations to participate in the survey were sent by e-mail to 5,000 randomly selected IEEE members, excluding government and military employees and students. Filling out the survey was strictly voluntary, with no incentive or penalty for participating or not. The response rate was 20.6 percent, yielding 1,029 usable survey responses. Representatives of the IEEE noted that the response rate was similar to other membership surveys they had conducted, attributing the low response rate to many members' e-mail addresses being out of date. It is possible, however, that those who responded felt more strongly about the topic of non-competes.⁴ The IEEE removed identifiers before delivering the survey data to me. Responses were distributed among several industries: software (20.5 percent), information technology (15.4 percent), automotive (14.0 percent), semiconductors (12.7 percent), consumer electronics (12.2 percent), aerospace and aeronautics (8.9 percent), computer hardware (5.8 percent), biomedical (5.5 percent), and other (5.0 percent).

Relative consistency between the ASR in-depth interviews and IEEE survey, shown in

Table 1, suggests that ASR could be representative of other technical industries. Percentages of respondents who were female or founder/CEO were not statistically distinguishable; neither were percentages who were asked to sign a non-compete, who complied with the request to sign, nor who changed employers after signing the agreement.

FINDINGS

I first review the connection between non-competes and technical professionals' post-employment trajectories, drawing primarily on in-depth interview data. Results confirm that firms use non-compete agreements to limit skilled workers' extra-organizational opportunities. I then use the survey data to examine the process by which firms obtain non-compete signatures from employees. Results confirm that career constraints are not unintended consequences of such contracts.

Career Detours: Involuntary Occupational Change

Individuals who complied with a non-compete agreement did not seek employment in the same industry but took *career detours* (i.e., they switched to a different technical field for the duration of the contract). Of the 110 job dyads for which I have non-compete data, 46 represent a worker's first job and 64 represent workers' subsequent jobs. Hereafter, I refer to these 64 dyads as "moves." (Ten workers held

Table 2. Estimates from Binary Logistic Regression Predicting Whether ASR Interviewees Changed Industries When Changing Jobs

	Model 1: No Controls	Model 2: Worker Controls	Model 3: Year Dummies
Move governed by non-compete	2.9153*** (.8343)	3.1137** (.9633)	3.2625** (1.0621)
Number of jobs held by worker		-.1363 (.1523)	-.2182 (.1722)
Worker had changed fields before		.4868 (.8328)	.6278 (.8147)
Number of patents held by worker		-.0580 (.0789)	-.0639 (.0787)
Founder/CEO		-1.3296 (.7895)	-1.7310* (.8473)
Female		-.5944 (.9716)	-.6828 (1.1234)
Constant	-.9694* (.4155)	-.0771 (.8291)	.4144 (1.1973)

Note: $N = 64$ moves among 36 interviewees. Standard errors are clustered by interviewee.
* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

only one job, so the 64 subsequent jobs are spread among 36 workers.) Of the 64 moves, in 24 moves a worker was bound by a non-compete from the prior employer (there were no non-competes in the remaining 40 moves). Workers changed industries much more frequently in moves where they were bound by a non-compete (21 of 24 moves, 87.5 percent), compared with workers who were not bound by non-competes (11 of 40 moves, 27.5 percent).

However, the 64 moves are not independent observations; they are spread among 36 workers. This leads to two concerns. First, the association between non-competes and career detours may appear exaggerated if driven by a few workers who held several jobs. The analysis thus takes into account the number of jobs held by each worker as well as whether a given worker had previously changed industries. Second, standard errors in statistical analysis may be understated due to the non-independence of some observations. Regressions in Table 2 thus cluster standard errors by worker. Model 1 in Table 2 shows a simple binary logistic model predicting whether a move involves a change of industry, depending

on whether a worker’s prior employer required a non-compete. The relationship between having signed a non-compete at one’s previous job and changing industries when changing jobs is statistically significant at the .001 level. Model 2 controls for individuals’ characteristics gathered from the interviews, including a worker’s number of jobs, number of patents, whether a worker was the founder/CEO of the firm, prior propensity to change fields, and an indicator for female (see descriptive statistics in Table 3). While none of these control variables are statistically significant, their inclusion increases the magnitude of the non-compete coefficient while lowering its statistical significance. Moreover, the non-compete result is robust to inclusion of year dummies in Model 3. This analysis indicates a strong correlation between non-competes and career detours. Nevertheless, workers may have a variety of reasons for changing fields when they change jobs, so it is important to assess whether non-competes actually played a role in the decision process, as opposed to other unobserved factors.

Accounts from informants indicate that non-compete agreements indeed influenced their

Table 3. Descriptive Statistics and Correlation Coefficients from the ASR Industry In-depth Interviewee Data

	<i>N</i>	Mean	SD	Min.	Max.	1	2	3	4	5	6	7	8
1. Move involved changing fields	64	.51	.50	0	1	1.00							
2. Move governed by non-compete	64	.36	.48	0	1	.58	1.00						
3. Worker had changed field before	64	.19	.39	0	1	.12	.16	1.00					
4. Number of jobs held by worker	64	3.55	1.69	1	7	-.11	-.17	.30	1.00				
5. Number of patents held by worker	64	3.48	3.31	2	20	-.13	-.12	-.09	-.09	1.00			
6. Founder/CEO	64	.20	.41	0	1	.00	.21	.16	-.18	-.06	1.00		
7. Female	64	.10	.30	0	1	-.15	-.17	-.16	-.09	-.04	-.06	1.00	
8. Year of move	64	1997	7.50	1981	2007	.38	.29	.35	-.14	-.07	.05	-.17	1.00

Note: Unit of analysis is a move—namely, a worker's subsequent jobs. The 64 moves are distributed among 36 interviewees.

decisions to take career detours. Of the 24 moves governed by non-competes, workers in six reported they took a career detour to comply with the non-compete. (These six dyads are from six different workers at five different employers.) In one case, the decision to take a career detour was driven directly by the threat of a lawsuit. A speech-recognition scientist recounted being reminded of his non-compete obligations by his former employer; he subsequently took a job with a firm in a different industry, but he grew frustrated with his inability to utilize the specialized ASR skills he had developed during his PhD studies. His former employer became aware that he was again looking for work in the industry and blocked his attempt. “I decided to go back and work on the core algorithms,” he recounted, “[but] when I interviewed with <ASR company>, my prior employer said ‘you can’t do that.’ It had only been one and a half years since I had left, and my agreement was two years. So, I ended up rejoining my former employer.”

In the other five cases, ex-employees proactively took a career detour to comply with the non-compete. These moves were not in response to direct threats from their former employers, but based on the expectation that the agreement would be enforceable. An engineering manager

at an ASR company explicitly ruled out working at companies within the same industry: “I purposely looked for non-speech companies because of the non-compete. In fact, I was recruited by some speech companies that I didn’t even consider.” Respondents even took career detours when termination was not voluntary. In one case, a speech recognition scientist with a PhD in the field had joined an ASR startup as an early employee but was fired following a disagreement with the founder. Rather than attempt to work in the same field, he left the ASR industry to avoid infringing on the agreement he had signed:

I had a very strong anti-competition agreement with <former employer> . . . so for two years I couldn’t have gotten involved in another speech recognition company in any case. The employees were very much aware of these non-competition agreements. And many of them, certainly the more sophisticated ones, on a regular basis would sort of do a gut check and say, “Well, if I’m ever gonna leave, what would I do for two years if I couldn’t do speech recognition?”

Taking a career detour affected occupational trajectories in at least two ways. First,

although informants who changed fields looked for jobs in which they could utilize some of their skills, they lost the ability to develop and enhance expertise specific to the industry they had abandoned. Moreover, non-competes restricted use of not just the training provided by the employer but also expertise developed prior to joining the firm, including during one's education. One ASR industry veteran said,

I've been in this industry for 20 years. I have a PhD in the field. I walked in the door with an enormous amount of experience, and while I worked there for a year and a half they added maybe, what, 2 percent to that? And now they want to prevent me from working in speech and using any of what I know?

Second, the inability to use their existing skills led informants to take jobs with compensation lower than they could earn if they were to continue to work in their chosen field. "I intentionally looked for general-purpose programming, and I took a substantial pay cut to go there," recalled a principal scientist who, although not formally threatened by her former employer, avoided any possible legal entanglement by taking a career detour. An ASR engineer who was careful only to take jobs for which he would not be required to sign a non-compete underscored the costs of career detours: "The only thing I'm not flexible on is that I want to stay in speech and I intend to die in it. That's what I'm good at. If I switched I'd be starting over. I'd take a pay cut and I'd be starting as a nobody."

The connection between non-competes and career detours was echoed by results from the IEEE survey, which covered several technology-based industries. Of 276 respondents who signed non-competes and then changed jobs, 90 (32.6 percent) reported taking a job in a different industry. The fact that similar proportions of in-depth interviewees (one-quarter) and survey respondents (nearly one-third) reported taking career detours in response to a non-compete indicates that the

threat of a non-compete lawsuit may have deterred technical professionals from continuing to work in their chosen industry. To be sure, not every non-compete resulted in a career detour, and workers have reasons other than non-competes for changing industries. Moreover, it is possible that some workers took career detours unnecessarily if, in fact, their ex-employers had no plans to file suit. That some workers decided to change industries even without the direct threat of a lawsuit speaks to the chilling effect a non-compete can have on technical professionals' career flexibility.

Firms' Management of the Process of Obtaining Employee Signatures for Non-competes

In arguing that firms strategically use non-competes to shape labor markets and career paths, it is important to address the alternative explanation that career detours are merely unintended consequences of these employment contracts, or that employees knowingly accept these restrictions on their future mobility and are compensated for doing so. Garmaise (2011) has established that wages are lower, not higher, where firms are not blocked from using non-competes, suggesting that workers are not negotiating more attractive job offers in exchange for signing a non-compete. Still, a skeptic might argue that even lacking a wage premium, workers enter employment contracts knowingly and thus have the opportunity to select among firms based on whether a particular employer will require a non-compete. The data, however, indicate that the process of signing a non-compete is not as transparent as a simple model of employment-contract bargaining might suggest.

If non-competes were truly used for the stated purpose of protecting proprietary information—and not to manage the external supply of labor (Fligstein and Fernandez 1988)—firms would have little reason not to be fully open regarding the requirement that employees sign such employment contracts.

Table 4. Timing of Non-compete Requests

	Percentage	Cumulative Percentage
At the time of the job offer	30.54	30.54
After the offer was accepted, but before the first day at the company	22.17	52.71
On the first day at the company	24.43	77.14
After the first day at the company	22.86	100

Note: Sample is restricted to IEEE survey respondents who signed a non-compete. *N* = 445.

But firms are less than transparent with would-be employees regarding non-compete agreements as a condition of employment. Instead, firms carefully manage the process of obtaining signatures for non-competes, usually not mentioning the non-compete until after a worker has accepted the job offer (and, presumably, has turned down other job offers). The individual’s bargaining power is thus minimized when the request for a non-compete is given. As Table 4 shows, survey respondents indicated that a non-compete was included with the employment offer less than one-third of the time. Nearly half of respondents said the non-compete was not presented until they had already started at the firm. One informant described his experience as follows:

I never received any information ahead of time before showing up. And then it was the first day when I had all the paperwork in front of me: health insurance, 401(k), and the non-compete. It was either “sign it and work here or don’t sign it and don’t work here.”

Waiting until workers have turned down other job offers to request a non-compete may not only increase the likelihood that workers will sign the non-compete, but it may also reduce the chance they will attempt to negotiate details of the contract. Respondents presented with a non-compete on their first day of work were considerably less likely to have a lawyer review the contract before signing than were those who received the non-compete at other times (4.6 versus 15.3 percent). An independent contractor characterized the

process as “in the 11th hour they just try to bully me into signing it.” Coupled with results regarding career restrictions that non-competes place on technical workers, the process by which firms obtain non-compete signatures suggests that firms do not use non-competes merely for the oft-stated reason of protecting trade secrets and research and development investment (Decker 1993).

DISCUSSION

This study explores how non-compete agreements enable firms to negotiate employment relationships with highly skilled workers, thereby shaping labor market patterns and career trajectories. To my knowledge, this study is the first to examine the incidence of non-competes among any workers other than top executives at large, publicly held companies (Garmaise 2011). Prior studies have used large data sets that do not indicate whether a particular individual signed a non-compete, but instead rely on state-level variation in non-compete enforcement (Fallick et al. 2006; Marx et al. 2009; Stuart and Sorenson 2003). By comparison, this study identifies whether individuals were required to sign non-competes at specific jobs they held.

These findings should not necessarily be generalized beyond highly skilled technical workers. Employees in non-technology industries may have access to information or goodwill in the form of customer relationships, which firms wish to protect (Decker 1993), so it is possible that non-competes are used even more broadly than this study would

indicate. Future work should collect data on the incidence of non-compete agreements among non-executives in non-technical fields. Moreover, the present findings should be viewed with caution. Future work should attempt to tighten the causal link, for example by exploiting non-compete policy reversals to examine whether workers are more likely to change fields once non-competes become enforceable. Because I gathered these data exclusively from employees, the conclusions do not reflect the firms' perspective. In fact, we know very little about when and how firms decide to use non-competes. Kaplan and Stromberg (2001) note that venture-capital contracts routinely stipulate that their portfolio companies must have non-compete contracts with employees, which may indicate that small companies typically do not use them. In any case, more fully understanding the internal firm dynamics of employment contracts is a direction for future work. It is unclear, however, how forthcoming human-resource professionals would be regarding their firms' use of restrictive employment contracts.

Despite these limitations, this study addresses how firms strike back against highly skilled technical professionals' increased mobility in the post-internal-labor-market era. By asserting property rights over workers' skills—not limited to training received at a firm but including expertise developed during their education or prior spans of employment—firms restrict the supply of labor within their industry. Externalized labor markets coupled with post-employment non-compete agreements allow firms to enjoy much of the loyalty associated with internal labor markets without having to invest in the training and career development that would make an internal labor market attractive. In other words, barriers to exit replace incentives to stay. In Fligstein and Fernandez's (1988) taxonomy, the market for highly skilled technical talent would seem to be classified as "worker-controlled," with greater allegiance to one's occupation than to one's employer. Technical workers subject to

non-competes, however, risk having to leave their occupations when they leave their jobs and may have to take career detours. Moreover, this outcome is not merely an unintended consequence of contracts ostensibly used to protect trade secrets. Rather, firms strategically manage the process of obtaining signatures, waiting to present the non-compete until an employee's bargaining power is minimized. Firms appear to accomplish these outcomes with minimal expenditure. Only one informant reported being formally sued and taken to court by an ex-employer; for the others, merely the threat of litigation sufficed to exert a chilling effect on their career plans.

To some extent, ex-employees subject to non-competes may appear to resemble displaced workers, whom Fallick (1996) defines as individuals with limited ability to return to a comparable job following an involuntary, structurally driven separation. Fallick notes that displaced workers tend to be disproportionately concentrated in low-skilled industries experiencing declining demand. By contrast, non-compete agreements affect highly educated workers in growing industries—even though work for which they are well-suited is available and would-be employers are eager to hire them. The demise of internal labor markets thus has deleterious consequences not only for lower-skilled workers (Kalleberg et al. 2003; Mishel et al. 2007; Sennett 1998), but also for highly skilled technical professionals who might seem ideally suited to exploit the promise of increased interorganizational mobility (Arthur and Rousseau 1996).

Non-compete agreements for individuals may produce social consequences that open up several avenues for future work. These include specialization versus generalism, allocation of talent to various types of organizations, geographic mobility, and stratification. Regarding specialization, findings indicate boundary conditions for career-development theories, including typecasting (Zuckerman et al. 2003), which advocates developing deep expertise in a particular field early in one's career. Not unlike the Barley and Kunda (2004) study,

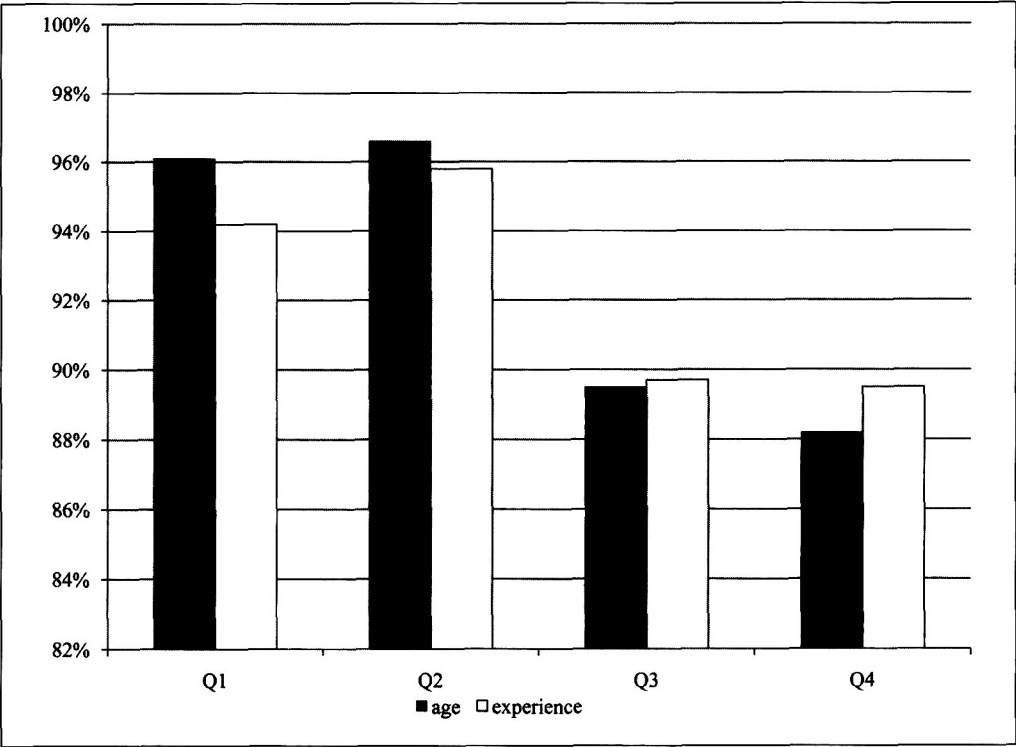


Figure 2. Compliance with Request to Sign Non-competes, by Age and Work Experience Quartiles

Note: $N = 1,029$ survey respondents in the IEEE survey. Age and work experience were determined from IEEE membership records.

Zuckerman and colleagues analyze data largely from California (feature-film acting) where non-competes are not enforceable. However, individuals who become typecast in labor markets unlike filmmaking—or academia—where non-competes constrain extra-organizational opportunities, may find themselves blocked from attractive career moves. Ironically, this risk may be particularly acute early in one’s career, when the benefit of typecasting should be greatest. Indeed, the IEEE survey reveals that young, less experienced workers are considerably less likely than their senior colleagues to refuse to sign a non-compete (see Figure 2). This study illustrates the limits of generalizing from labor market studies of California workers’ mobility and provides a more representative picture of the modern social organization of work.

Moreover, if workers fear that non-competes will prevent them from capitalizing on the market for their skills, they may fail to invest in such expertise in the first place. Rosen (1983) argues that returns to the cost of developing a skill are increasing in the utilization of that skill; hence, it can be advantageous for individuals to specialize. But aspiring technologists may be reluctant to spend years in a PhD program only to be limited in the number of firms where they can deploy their expertise. Alternatively, individuals who develop considerable specialized knowledge may remain at universities or other organizations that generally do not use non-competes, rather than accept employment at firms that could block them from deploying their skills elsewhere. If so, the widespread use of non-competes could make

it more difficult for firms to attract talent. Given the legal system's asymmetric costs for small firms (Lerner 1995), individuals who wish to change jobs without changing industries may be more likely to join large, established firms that can more credibly promise to defend them against a lawsuit from their prior employer (Marx 2010). Non-competes may thus make it difficult for young startup companies to attract specialized expertise, except from universities. Further research in this vein could help answer Sorensen's (2007:401) call for scholars to consider "the indirect effects of policies not directly related to entrepreneurship that directly or indirectly support and sustain large, established firms."

Non-competes may affect the distribution of talent not just among organizations but among regions as well, if variation in enforcement of non-competes gives rise to cross-regional mobility. To the extent that workers are aware of and concerned about having to take career detours, they may strategically relocate to states where non-competes are illegal in order to preserve their career flexibility. Marx, Singh, and Fleming (2010) find evidence of such a brain drain effect using data from the U.S. Patent Office and an unanticipated reversal of non-compete enforcement policy in Michigan. Alternatively, if workers fail to emigrate in order to avoid a non-compete, we might expect to see different patterns of specialism versus generalism depending on whether a given region enforces non-competes.

Finally, it is possible that non-competes contribute to stratification. Career detours are most deleterious for individuals who are not financially independent and require sustained employment; individuals with greater wealth may be at least partially insulated from the consequences of non-competes. For example, one informant reported that instead of taking a career detour, he accepted an unpaid position at a local university to "wait out" his non-compete before founding his next firm. He was only able to forgo paid employment for a full year thanks to the financial liquidity from the acquisition of his prior startup.

Wealthy individuals may also be able to buy out their non-compete agreements by paying their former employer to release them from the contract.⁵ In these and other ways, non-competes may exacerbate existing patterns of stratification because individuals without means are further limited in their professional mobility. Given that enforcement of non-competes is governed by the state, this research begins to address Morris and Western's (1999:625) lament that sociologists have been "strangely and remarkably silent" regarding how formal institutional arrangements other than the minimum wage and unionization affect patterns of inequality (see also DiPrete 2007).

In addition to theoretical considerations, the findings are of use to policymakers because the state sanction of non-competes remains controversial. In 2008 alone, four states reformed their non-compete laws; some states restricted enforceability of non-competes, others expanded firms' rights to use such contracts.⁶ That policymakers continue to come to such varying conclusions regarding non-compete policy indicates a lack of consensus regarding the implications of these contracts. Considering that firms take steps to make it difficult for employees to refuse to sign non-competes, one could argue that, at the very least, states should adopt reforms similar to Oregon (Or. SB248), where employers must notify potential hires in the offer letter that they will be required to sign a non-compete. Data from the present study are currently being used in discussions of non-compete reform in Massachusetts.

Although non-competes continue to be controversial in part because interests of firms and workers appear opposed, firms may also be disadvantaged by non-competes. Motta and Roende (2002) propose that workers subject to non-competes will underperform because firms fail to fully reward them given their lack of outside job options. Some informants in this study reported feeling discouraged by the request to sign a non-compete. For example, a technical manager I interviewed said: "It took the wind out of my

sails. You're gung ho, you're in the honeymoon phase with a company, you're in love with what's going to happen, and then the non-compete takes you back into a hard reality. I felt like I had been slapped in the face, like I wasn't being trusted. It's like 'prove to me that you love me, write this down' . . . kind of like a prenuptial. It meant maybe at some point that I didn't stay really late—I went home." Determining the extent to which non-competes affect on-the-job motivation is a key topic for future research.

Even if non-competes do provide a net benefit to individual firms—although this remains uncertain—the question of their overall affect on society is still unresolved. Do advantages to firms (i.e., more easily protecting trade secrets) outweigh detriments to technical professionals (i.e., career inflexibility)? Is it in the greater economic interest to bind workers to existing firms instead of enabling them to join new, entrepreneurial ventures? Answers to these questions will assist policymakers in determining the appropriate level of regulation for such employment contracts.

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Notes

1. The remaining 31 percent of informants in the Barley and Kunda (2004) study were drawn from six states (i.e., Connecticut, Georgia, Maryland, Montana, Texas, and Washington), half of which restrict the use of non-competes (i.e., Connecticut, Montana, and Washington). That the non-compete issue did not

surface in their study is perhaps explained by how few of their informants worked in states where firms are not blocked from using non-competes.

2. When signing a non-disclosure agreement, workers typically are allowed to exempt prior art that could overlap with the intellectual property of the firm they are joining. Neither informants in this study nor employment lawyers I spoke with were able to recall any such exemptions of prior expertise in a non-compete contract.
3. Garmaise (2011) constructs a measure of non-compete use by reviewing 10K reports for a random sample of 500 Execucomp firms. However, in his analysis of the impact of policy differences on the population of Execucomp firms, this information is not used.
4. If workers who felt more strongly about non-competes were more likely to respond to the IEEE survey, then the percentage of respondents who signed a non-compete might be higher than the general population. Given that the other survey questions were conditional on having signed a non-compete, those responses are less likely to be biased. Moreover, this limitation does not apply to findings from the interview data.
5. For example, in 2005 Nortel Networks paid \$11.5 million for the right to hire as its CEO Motorola COO Mike Zafirovski, who was subject to a non-compete agreement (McMillan 2006).
6. Idaho (Id. SB1393) and Louisiana (La. R.S. 23:921) extended firms' ability to enforce non-competes, while Oregon (Or. SB248) and New York (Ny. S02393) restricted their ability to do so. China recently added a requirement (PRC Labor Contract Law of 1 January 2008, Article 23) that firms enforcing non-competes against ex-employees compensate them during the term of the agreement.

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- Matt Marx** is Alvin J. Siteman (1948) Professor of Entrepreneurship and Assistant Professor of Technological Innovation, Entrepreneurship, and Strategic Management at the Massachusetts Institute of Technology Sloan School of Management. His primary stream of research focuses on the use of employee non-compete agreements in the information economy and their impact on individual careers, firm-level outcomes, and regional economic development.